ABSTRACT

A fullerene-antibiotic conjugate including at least one antibiotic molecule per fullerene moiety. The fullerene may comprise C_{60} and the antibiotic may comprise vancomycin or may be selected from the group consisting of penicillins, cephalosporins, quinolones, fluoroquinolones, macrolides, lincosamines, carbepenems, conobactams, aminoglycosides, glycopeptides, tetracyclines, sulfonamides, rifampin, oxazolidonones, and streptogramins. The conjugate preferably includes at least two and more preferably at least three antibiotic molecules per C_{60} center. A method for making a fullerene(C_{60})-antibiotic conjugate, comprises: synthesizing a linker precursor (I); reacting the linker precursor (I) with C_{60} via a Bingel-reaction, to produce a fullerene-linker conjugate (II); hydrolyzing the fullerene-linker conjugate (II), resulting in a desired derivative of C_{60} (III); and reacting the derivative (III) with a desired antibiotic to produce a fullerene-antibiotic conjugate (IV).